Journal of Analytical Chemistry 2011 vol.66 N7, pages 633-641

# Electrochemical behavior and voltammetric determination of cysteine and cystine at carbon-paste electrodes modified with metal phthalocyanines

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## Abstract

The electrochemical behavior of cysteine and cystine on carbon-paste electrodes modified with Fe(II), Co(II), Ni(II), and Cu(II) phthalocyanines is studied. Metal phthalocyanines exhibit catalytic activity in the electrooxidation of cysteine and cystine and in the reduction of cystine. The best catalyst is the cobalt complex. In the electrooxidation of cysteine, the catalysts are electrogenerated complex species of Co(II)Pc or Co(III)Pc +, and in the oxidation of cystine, oxidized or reduced forms of the coordinated ligand. Various versions of the determination of cysteine and cystine by the electrocatalytic reactions on the modified electrodes are proposed.


http://dx.doi.org/10.1134/S1061934811050182

## Keywords

chemically modified electrodes, determination of cysteine and cystine, electrocatalysis, metal phthalocyanines, voltammetry